

Short Communications

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Incubation Period and Behavior at a Bar-tailed Godwit Nest

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ABSTRACT.—Several standard references report the incubation period of the Bar-tailed Godwit (*Limosa lapponica*) as 20–21 days, but the source of those statements is unclear and may be based on speculation. Here, I report an incubation period at a nest in Alaska that was estimated to be between 21.7 and 23.8 days. This is consistent with incubation periods of three other species of godwit, which are reported to be 22–26 days. At the Alaskan nest, both sexes incubated and would not flush until approached within about 0.6 m. No special displays were observed when the male relieved the female at the nest. The chicks departed the nest when less than 1 day old. Received 28 October 2003, accepted 10 June 2004.

According to McCaffery and Gill (2001), the incubation period of the Bar-tailed Godwit (*Limosa lapponica*) is 20 to 21 days. Those authors cite Cramp and Simmons (1983) as their source. Cramp and Simmons (1983:479) state: "INCUBATION. 20–21 days. By both sexes but ♂ said to take major share (Witherby et al. 1940)." If their source for the incubation period was Witherby et al. (1940), then the 20–21 day period may be questioned. Witherby et al. (1940:157) give the incubation period as "about 3 weeks, but not definitely known."

Both sexes incubate, but there is conflicting information on which sex incubates most by day and night, and there is little information on changeover activities or on timing of departure of chicks from the nest (McCaffery and Gill 2001). Here, I report observations on the incubation period and behavior of Bar-tailed Godwits at a nest near Hooper Bay, Alaska.

In 1960, R. G. B. Brown, N. G. Blurton-Jones, and I spent approximately 3 months (early May to mid-August) in the vicinity of

Hooper Bay, Alaska (61° 35' N, 166° 05' W). We kept detailed records of all nests that we found and deposited them with the Alaska Nest Records Scheme at the University of Alaska Museum in Fairbanks.

Male and female Bar-tailed Godwits were easily distinguished when off the nest by the color of the underparts: mostly rufous-brown in the male and light gray-brown to white in the female. In the pair that we observed, the male was also noticeably smaller than the female.

Our first observation of a Bar-tailed Godwit occurred on 22 May at 18:00 AKST (subtract 2 hr 4 min to calculate Mean Solar Time), when we flushed a female off a nest containing three eggs. Although scattered pairs of Bar-tailed Godwits were seen throughout the area, we found no other nests. Our next visit to the nest was at 16:00 on 31 May, when we did not flush the incubating bird or determine its sex. On 1 June at 15:45, we flushed the male from the nest and found that it contained four eggs. On 13 June at 13:00, we noted that all four eggs were "just cracked." On 14 June at 15:00, the eggs were pipping "with one bill through" the shell of one of the eggs; at 22:00 that evening we found two newly hatched young and two eggs. On 15 June at 12:30, all four young were leaving the nest, with the female brooding them and the male standing guard nearby. Therefore, the fourth egg hatched between 22:00 on 14 June and 12:30 on 15 June. When the young departed the nest, the oldest and youngest chicks had been out of the egg for <22.5 and <14.5 hr, respectively.

We observed the male incubating on five occasions, at the following times: 15:45, 19:00, 19:00 (relieving the female, see below), 20:45, and 22:00 (with two newly hatched chicks and two eggs); mean = 19:18. The female was seen on the nest on seven occasions: 13:00, 14:00, 15:00, 17:00, 18:00 (with three eggs), 19:00 (relieved by male) and 19:30:

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mean = 16:30. Neither bird left the nest until we approached within about 0.6 m. Our observations were not randomly distributed throughout the day, so it is not possible to conclude that one or the other sex took the larger share of incubation during specific hours, but they do indicate that the male was often found on the nest in the evening and the female more frequently earlier in the day.

I watched the Bar-tailed Godwit nest from a blind for >2 hr during the afternoon of 11 June and recorded the incubating birds on 16 mm movie film. Initially, the female was incubating. She spent much of her time alert with her head partially or fully raised. At 20:00 the male relieved her. As he walked slowly toward the nest, the female called briefly and crouched low. He approached to within a few cm before she rose and flew directly from the nest. The male then settled on the eggs, facing in the opposite direction to the female's previous position. His subsequent behavior was similar to that of the female, alert with head raised.

The laying intervals of the Bar-tailed Godwit, the Marbled Godwit (*Limosa fedoa*), and the Hudsonian Godwit (*Limosa haemastica*) are unknown (Hagar 1966, Gratto-Trevor 2000, McCaffery and Gill 2001, Elphick and Klima 2002), but in the Black-tailed Godwit (*Limosa limosa*) the interval is 1–2 days (24–45 hr) with a clutch of four usually taking 5 days to complete (Cramp and Simmons 1983). Assuming that the laying interval in the Bar-tailed Godwit is approximately 1.5 days, the fourth egg in our nest was laid between 18:00 on 22 May and 06:00 on 24 May. These times indicate that the incubation period from laying to hatching for the fourth egg was between 21 days 16 hr and 23 days 18.5 hr. The mid-point of the range, 22 days 17.3 hr, is an estimate of the most probable length of the incubation period in this nest, given the preceding assumptions. If the laying interval was longer than 1.5 days and the female had laid her third egg shortly before we found the nest, the incubation period may have been shorter than 21 days 16 hr, but this seems unlikely.

My estimate of the minimum incubation period for this nest (21.7 days) is longer than the 20–21 days cited by Cramp and Simmons (1983) and McCaffery and Gill (2001). How-

ever, the latter period may be inaccurate if it is based on the speculative estimate of Witherby et al. (1940). My mean and maximum estimates (22.7 days and 23.8 days, respectively) are within the ranges reported for other godwit species: Black-tailed Godwit, 22–24 days (Cramp and Simmons 1983); Hudsonian Godwit, 23.5 days in one nest (Jehl and Husnell 1966); Marbled Godwit, little information but 23–24 days in one nest and “normally 24–26 d (M. Ryan unpubl. data)” (Gratto-Trevor 2000:13). It seems likely that the normal incubation period of the Bar-tailed Godwit is longer than 20–21 days and is probably usually within the 22–24 day range, as indicated for the nest reported here.

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